

at one or more amino acid positions, said positions selected from the group consisting of Leu₁₇₃; Ala₁₇₉, Met₁₈₀, Arg₁₈₁, Ser₉₈, Ser₂₅₅ and Leu₁₉₈ in *Arabidopsis* or at an analogous amino acid residue in an EPSPS paralog;

b. identifying a cell having a mutated EPSPS gene, which cell has substantially normal growth as compared to a corresponding wild-type plant cell; and

c. regenerating a non-transgenic herbicide resistant or tolerant plant from said plant cell.

15. (As Twice Amended) A method for producing a non-transgenic herbicide resistant or tolerant plant comprising

a. introducing into a plant cell a recombinagenic oligonucleobase to produce a mutant EPSPS gene that expresses an EPSPS protein that is mutated at one or more amino acid positions, said positions selected from the group consisting of Leu₁₇₃; Ala₁₇₉, Met₁₈₀, Arg₁₈₁, Ser₉₈, Ser₂₅₅ and Leu₁₉₈ in *Arabidopsis* or at an analogous amino acid residue in an EPSPS paralog;

b. identifying a cell having a mutated EPSPS gene, which encoded mutant EPSPS protein has substantially the same catalytic activity as compared to a corresponding wild type EPSPS protein; and

c. regenerating a non-transgenic herbicide resistant or tolerant plant from said plant cell.

20. (As Twice Amended) The method according to claim 14 in which the positions in the *Zea mays* paralog are selected from the group consisting of Leu₉₇, Ala₁₀₃, Met₁₀₄, Arg₁₀₅, Ser₂₃, Ser₁₇₉, and Leu₁₂₂.

21. (As Twice Amended) The method according to claim 14 in which the positions in the *Brassica napus* paralog are selected from the group consisting of

22. (As Twice Amended) The method according to claim 14 in which the positions in the *Petunia hybrida* are selected from the group consisting of Leu₁₆₉, Ala₁₇₅, Met₁₇₆, Arg₁₇₇, Ser₉₄, Ser₂₅₁ and Leu₁₉₄.

Please add the following new Claims 25, 26, 27 and 28:

25. The method according to claim 15 in which the positions in the *Zea mays* paralog are selected from the group consisting of Leu₉₇, Ala₁₀₃, Met₁₀₄ Arg₁₀₅, Ser₂₃, Ser₁₇₉, and Leu₁₂₂.

26. The method according to claim 15 in which the positions in the *Brassica napus* paralog are selected from the group consisting of Leu₁₆₉, Ala₁₇₅, Met₁₇₆, Arg₁₇₇, Ser₉₄, Ser₂₅₁ and Leu₁₉₄.

27. The method according to claim 15 in which the positions in the *Petunia hybrida* are selected from the group consisting of Leu₁₆₉, Ala₁₇₅, Met₁₇₆, Arg₁₇₇, Ser₉₄, Ser₂₅₁ and Leu₁₉₄.

28. A method for producing a non-transgenic herbicide resistant or tolerant plant comprising:

a. introducing into a plant cell a recombinagenic oligonucleobase to produce a mutant EPSPS gene that expresses an EPSPS protein that is mutated in two amino acid positions, said positions selected from the group consisting of Thr₁₇₈ and Pro₁₈₂, in *Arabidopsis* or at an analogous amino acid residue in an EPSPS paralog wherein the Thr₁₇₈ is changed to Val or Leu and Pro₁₈₂ is changed to Ser;

b. identifying a cell having a mutated EPSPS gene, which cell has substantially normal growth as compared to a corresponding wild-type plant cell; and

c. regenerating a non-transgenic herbicide resistant or tolerant plant